

WE CLAIM:

1. A data switching node having a switching engine comprising:

- a. a data traffic management database,
- b. a data traffic management processor updating the data traffic management database in performing data traffic management, and
- c. a data switching processor switching data traffic based on routing entries in a switching database subject to data traffic shaping criteria held in the traffic management database

whereby the data traffic management processor relieves the data switching processor of intensive traffic management computations in providing guaranteed levels of service.

2. A data switching node as claimed in claim 1, wherein the data traffic management database stores resource utilization information, the resource utilization information specifying a current state of the data traffic conveyed by the data switching node.
3. A data switching node as claimed in claim 2, wherein the resource utilization information is stored in a bit encoded form.
4. A data switching node as claimed in claim 1, wherein the data traffic shaping criteria includes data traffic shaping heuristics enabling the data switching processor to enforce service level guarantee data traffic constraints on data traffic flows processed by the data switching node.

5. A data switching node as claimed in claim 1, wherein the switching engine further comprises a service level agreement database associated with the data traffic management processor, the service level agreement database holding service level guarantee specifications in providing data services.
6. A data switching node as claimed in claim 1, wherein the data switching node further comprises information exchange means enabling communication between the data switching processor and the data traffic management processor.
7. A data switching node as claimed in claim 6, wherein the information exchange means includes a communications protocol providing notification to the data traffic management processor upon processing at least one Payload Data Unit (PDU).
8. A data switching node as claimed in claim 7, wherein the communications protocol further provides notification to the data switching processor upon updating the data traffic management database.
9. A data switching node as claimed in claim 6, wherein the information exchange means includes a working store.
10. A data switching node as claimed in claim 9, wherein the working store comprises multi-ported random access memory enabling concurrent access thereto by the data switching processor and the data traffic management processor.

11. A data switching node as claimed in claim 9, wherein the data traffic management processor includes the working store.
12. A data switching node as claimed in claim 9, wherein the information exchange means includes a communication protocol, the communications protocol including direct memory writes to the working store in providing notification of the processing of the at least one PDU.
13. A data switching node as claimed in claim 6, wherein the information exchange means includes data registers internally associated with the data switching processor, the data registers storing at least a portion of the data traffic management database.
14. A data switching node as claimed in claim 13, wherein the data registers comprise multi-ported random access memory enabling concurrent access thereto by the data switching processor and the data traffic management processor.
15. A data switching node as claimed in claim 13, wherein the information exchange means includes a communications protocol, the communications protocol including direct memory writes to the data registers on updating the data traffic management database.
16. A data switching node as claimed in claim 7, wherein the information exchange means further comprises a trigger associated with the data traffic management processor, the trigger being activated by a notification of processing of the at least one PDU.
17. A data switching node as claimed in claim 6, wherein the information exchange means further comprises at

least one dedicated data bus for communication between the data switching processor and the data traffic management processor.

18. A method of enforcing service level agreements for data traffic flows conveyed by a multiport data switching node, the method comprising steps of:

- a. extracting header information from a Payload Data Unit (PDU) received by a switching processor from an input port of the data switching node;
- b. querying a switching database to determine an output port to forward the PDU;
- c. querying a data traffic management database maintained by a data traffic management processor, the data traffic management database storing data traffic management information;
- d. processing the PDU subject to data traffic constraints and current states of the data traffic flows included in the data traffic management information;
- e. selectively providing feedback information to the data traffic management processor regarding actions taken by the switching processor in processing the PDU; and
- f. updating the data traffic management database upon computing a current state of the data traffic flows based on the provided feedback information

whereby the switching processor is relieved of intensive data traffic management computations.

19. A method as claimed in claim 18, wherein processing the PDU the method further comprises a step of processing the PDU subject to data traffic shaping heuristics providing data traffic flow control for the input port.
20. A method as claimed in claim 18, wherein processing the PDU the method further comprises a step of processing the PDU subject to data traffic shaping heuristics providing data traffic flow control for the output port.
21. A method as claimed in claim 18, wherein computing the current state of the data traffic flows the method further comprises the step of querying a service level agreement database associated with the traffic management processor to determine service level guarantees.
22. A method as claimed in claim 18, wherein processing the PDU the method further comprises a step of processing the PDU subject to data traffic shaping heuristics providing data traffic flow control for the output port.